REMARKS

Applicants note that this response if being filed with regard to a Final Office Action. The arguments presented herein are intended to place the application in condition for allowance or at least to reduce the issues upon appeal. Therefore, entry of this response is respectfully requested.

As an initial matter, Applicants thank Examiner Mullis for taking part in the Examiner Interview on June 2, 2008. In addition to Examiner Mullis and Applicants' representative Jeffrey Lomprey, Dr. K. Arora from BASF was present for the interview. During the interview, the claims as pending were discussed in view of the cited references, in particular, Emmons and Gottschalk were addressed. While no agreement was reached, the Examiner did indicate that the Applicants' arguments with regard to the aminoloysis of Emmons and the use of the Markush group with respect to the claims rejected under Gottschalk would be fully considered. These arguments are fully described below.

Claims 1 and 5-73 are currently pending. No claims have been amended.

I. Claim Rejections Under 35 U.S.C. § 102.

Claims 1, 5-8, 12-19, 21-23, 25, 26, 28-38, 45-53, and 56-60 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,120,839 issued to Emmons *et al.* Applicants respectfully traverse this rejection.

Applicants stand by their remarks of record and in the interview with the Examiner, with regard to the applicability of Emmons to presently claimed invention. As stated by the Applicants, the presently claimed invention does not read upon the materials described by Emmons, as the oligomers of Emmons are subjected to an aminolysis step prior to reaction with a polymer.

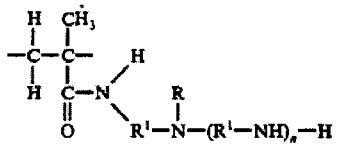
Applicants' claim 1 recites:

> An oligomer-modified anionically polymerized polymer comprising the reaction product of:
>
> (a) a free-radically polymerized oligomer obtained from reaction of one or more monomers selected from the group consisting of vinyl

> aromatic monomers and ester functional monomers and one or more monomers selected from the group consisting of epoxy functional monomers, anhydride functional monomers, ester functional monomers and carboxylic acid functional monomers, the oligomer having a number average molecular weight of about 1000 to about 5000 g/mol and a weight average molecular weight of about 1500 to about 18,000 g/mol; a number average number of functional groups from about 4 to about 12; and a polydispersity index of about 1.5 to about 4.5 and
>
> (b) an anionically polymerized polymer;
>
> wherein the number average number of functional groups is calculated based upon functional groups selected from the group consisting of epoxy functional groups, anhydride functional groups, and carboxylic acid functional groups.

Thus, the instantly claimed polymers comprise a free-radically polymerized oligomer, and an anionically polymerized polymer. The free-radically polymerized oligomer is further made from the reaction of the monomers specified in the designated Markush groups. The free-radically polymerized oligomer must also have, at least in part, a number average number of functional groups from about 4 to about 12, where this number is based upon functional groups selected from the group consisting of epoxy functional groups, anhydride functional groups, and carboxylic acid functional groups. Emmons fails to teach such elements.

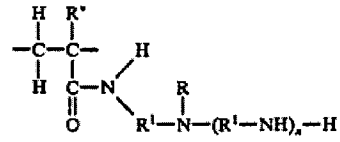
Emmons teaches aminolysis products obtained by reaction of acrylate or methacrylate oligomers having a number-average molecular weight (Mn) in the range of 600 to 10,000, preferably in the range of 1,000 to 5,000 with aliphatic amines. Col. 2, lines 14-22. The aminolysis products disclosed by Emmons are described as having the following structures after aminoloysis:



(II)

wherein R is H or $-R^1NH_2$; n is 0 to 4 and R^1 is aliphatic hydrocarbyl, e.g., alkylene of 2 to 6 carbon atoms.

In oligomers having aminolyzed acrylate ester units, such units have analogous structure and a suitable generic representation of the structure is:



(IIa)

wherein R^* is H or CH_3 and n, R and R^1 are as defined above.

These structures are acrylamides, as described by Emmons. See Col. 5, lines 13-42. These structures are not epoxy functional groups, anhydride functional groups, and carboxylic acid functional groups.

In the rejection, the Examiner states that Emmons "disclose[s] a process utilizing an anionically produced polyether epoxy polymer (see "IV" and "V" in column 7) and a free radically produced acrylate in Example 7..." Office Action, page 2. The Examiner also points to Example 24 in which the Example 7 material is used. *Id.*

However, as shown above, the materials of Emmons are aminolysis products. In example 7, Emmons shows the polymerization of butyl acrylate, methyl methacrylates, and acrylic acid in part (a). This material is then subjected to aminolysis in part (b). Applicants contend that the aminolysis is complete, based upon the teachings of Emmons, so that when the aminolysis product from part (b) is reacted with an epoxy functional polymer in example 24, the aminolysis product from part (b) is not encompassed by the presently presented claims. It should be noted in part (b), 0.355 mol of the polymer from part (a) is reacted with 1.26 mol of diethylenetriamine. Because there is one secondary and two primary amines present in diethylenetriamine, the actual molar ratio of amine to polymer is 3.78:0.355. Thus, the amine functionality, before aminolysis, is present at a nearly 10 fold excess. As such, the vast amount of the carboxyl functionality of

the Emmons oligomers is converted to the structures shown above, and in Col. 5 of Emmons. The remaining functionality may be a carboxylate with an amine salt counterion, but the amount of such material is unknown based upon the teachings of Emmons. Considering the extent to which the amine is in excess, Applicants believe that the amount would be de minimis, and therefore, any residual carboxylic acid functionality in the material from part (a) of Emmons' example 7, that could conceivably carry through the aminolysis process, would fail to achieve the stated number average number of functional groups required by the claim.

Applicants submit that the presently claimed compositions are novel over the Emmons reference. Because Emmons fails to teach each and every element of the claims as currently presented, Emmons cannot be found to anticipate any of the independent claims currently pending, and, by definition, all of the claims depending therefrom. Applicants respectfully request removal of the rejections under 35 U.S.C. § 102.

II. Claim Rejections Under 35 U.S.C. § 103.

Gottschalk in view of McCormick, Klier, or Emmons

Claims 61-63, 66-74, and 76 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,998,554, issued to Gottschalk, *et al.*, in view of U.S. Patent Publication No. 2006/0111532, applied for by McCormick *et al.*, or U.S. Patent No. 6,143,820, issued to Klier, or Emmons. Applicants respectfully traverse this rejection.

During the Examiner Interview, this particular rejection was discussed within the context of Gottschalk. Applicants pointed out that claim 61 recites, in part, "the reaction product of a free-radically polymerized oligomer obtained from reaction of one or more monomers selected from the group *consisting of*...and one or more monomers selected from the group *consisting of*..." Thus, Applicants have defined the oligomer in terms of a Markush group. During the interview, the Examiner stated that Markush groups require that one of the listed materials be present, but that other materials can also be used. This is wholly inconsistent with the jurisprudence and intent of the Markush group.

A Markush Group is a Closed Listing by Definition

Markush groups are exclusive lists from which the identified element is selected, when the group is preceeded by the transitional term "consisting of." The elements of Markush groups are described within the MPEP as "alternatives in a format such as 'selected from the group consisting of A, B, and C." MPEP 803.02. Much of the jurisprudence surrounding the interpretation of Markush groups, lies in what constitutes valid Markush language, however this seems to be a long settled debate, as evidenced by MPEP 803.02.

Other jurisprudence, has been directed to the importance of a Markush listing. As shown by the citations below, Markush listings, preceeded by the transitional phrase "consisting of" are the whole listing of items from which that particular element of the claim may be chosen, to the exclusion of all others.

> A Markush group is a listing of specified alternatives of a group in a patent claim, typically expressed in the form: a member selected from the group consisting of A, B, and C. Therefore, "if 'wherein R is a material selected from the group consisting of A, B, C and D" is a proper limitation then 'wherein R is A, B, C or D' shall also be considered proper." In re Harnisch, 631 F.2d 716, 724 [206 USPQ 300] (CCPA 1980) (containing an Appendix describing Patent Office practice); see Manual of Patent Examining Procedure (MPEP) §2173.05(h) (8th ed. 2001); see also Robert C. Faber, Landis on Mechanics of Patent Claim Drafting, §50, 5A, VI-5-6 (4th ed. 2002) ("A Markush group is a sort of homemade generic expression covering a group of two or more different materials (elements, radicals, compounds, etc.), mechanical elements, or process steps, any one of which would work in the combination claimed."). It is well known that "members of the Markush group are ... alternatively usable for the purposes of the invention." In re Driscoll, 562 F.2d 1245, 1249 [195 USPQ 434] (CCPA, 1977). **Moreover, "[a] Markush group, incorporated in a claim, should be '*closed*,' i.e. it must be characterized with the transition phrase 'consisting of,' rather than 'comprising' or 'including.'"** Stephen A. Becker, Patent Applications Handbook §2:17 (9th ed. 2000). Thus, "members of the Markush group are used singly." See Meeting Held to Promote Uniform Practice In Chemical Divisions, 28 J. Pat. & Trademark Off. Soc'y 849, 852 (1946) (listing practices approved by the primary examiners of the USPTO's chemical group).

Abbott Laboratories v. Baxter Pharmaceutical Products Inc. 67 USPQ2D 1191 (Fed. Cir. 2003), emphasis added.

> A Markush group is a form of drafting a claim term that is approved by the PTO to serve a particular purpose when used in a claim—**to limit the claim to a list of specified alternatives.**

Abbott Laboratories v. Andrx Pharmaceuticals Inc. 81 USPQ2d 1289, 1300 (Fed. Cir. 2007), emphasis added.

> A Markush group lists specified alternatives in a patent claim, typically in the form: a member selected from the group consisting of A, B, and C. See Manual of Patent Examining Procedure §803.2 (2004). **A Markush group by its nature is *closed*.** If an applicant tries to claim a Markush group without the word "consisting," the PTO will insist upon the addition of this word to ensure a closed meaning. Thus, in order to "close" a Markush group, the PTO insists on the transition phrase "group consisting of." See Abbott Labs. v. Baxter Pharm. Prods., Inc., 334 F.3d 1274, 1280 [67 USPQ2d 1191] (Fed. Cir. 2003). Without the word "consisting" the simple phrase "group of" is presumptively open.

Gillette Co. v. Energizer Holdings Inc. 405 F3d 1367, 74 USPQ2d 1586, 1591 (Fed. Cir. 2005).

This is just a small sample of the understanding by practitioners in the field that the Markush group is a closed group of items, that effectively excludes other items without specific negative provisos. The Examiner's assertion that a Markush listing is a requirement for the presence of at least one of the recited items is not correct. As shown above, the Markush listing is the *entire* listing of possible items for the element to which it refers.

Comprising At The Beginning Of A Claim Does Not Open A Markush Listing To Other Elements

Even the transitional phrase "comprising" is insufficient to broaden the scope of a narrowly defined term, such as a term confined by a Markush group. This was shown in the matter of *Dippin' Dots Inc. v. Mosey* [81 USPQ2D 1633, 1638 (Fed. Cir. 2007)]. At issue within that case, was whether a claim that recited "freezing said dripping alimentary composition into beads;" encompassed shapes other than beads. The court had determined that a bead was a round shape. The patentee argued that because the claim was directed to "[a] method of preparing and

storing a free-flowing, frozen alimentary dairy product, *comprising* the steps of..." that the "comprising" transitional phrase opened each element up to the inclusion of other shapes. However, the court disagreed, stating that:

> "Comprising" appears at the beginning of the claim—"comprising the steps of"—and indicates here that an infringing process could practice other steps in addition to the ones mentioned. Those six enumerated steps must, however, all be practiced as recited in the claim for a process to infringe. **The presumption raised by the term "comprising" does not reach into each of the six steps to render every word and phrase therein open-ended—*especially where, as here, the patentee has narrowly defined the claim term it now seeks to have broadened.*** The district court's limitation of the claim scope to exclude processes that produce some irregularly shaped particles is correct.

Id. at 1638, emphasis added. Here, Applicants have narrowly defined a claim term by the use of aMarkush group. Applicants submit that the use of "comprising," as the transitional phrase, does not open the Markush group to other items. Here the Markush group is to be read as the complete list from where those monomers may be chosen.

Furthermore, the phrase leading up to the Markush groups, states that it is "one or more monomers selected from the group consisting of." In other words, at least one of those monomeric groups must be used, and while others may also be used they must all be chosen from the designated group. Such language effectively eliminates the required acyrlonitrile groups of Gottschalk, and the ethylene copolymers of Brandstetter, as more fully described below.

Gottschalk Requires A Group Effectively Excluded By the Markush Listing

The Examiner admits that there "are no examples in Gottschalk of B components with applicants weight average molecular weights and number average molecular weights." Office Action, page 3. Applicants agree and take this one step further: there are no examples in Gottschalk of compounds encompassed by the oligomers of the presently claimed invention, as the compounds of Gottschalk are excluded by the Markush language of the presently claimed invention.

As recited in claim 61, "...(a) a free-radically polymerized oligomer obtained from reaction of *one or more monomers selected from the group consisting of vinyl aromatic monomers and ester functional monomers* and *one or more monomers selected from the group consisting of epoxy functional monomers, anhydride functional monomers, ester functional monomers and carboxylic acid functional monomers...*" Emphasis added. All of the Gottschalk polymers are based upon vinyl aromatic and *acrylonitrile* monomers. As will be recognized, acrylonitrile is not one of the polymers recited in either of the Markush listings. Gottschalk specifically requires the presence of **both** a vinyl aromatic (50 to 99.9%) and either acrylonitrile, methacrylonitrile, or a mixture thereof (0.1 to 50%). Col. 3, lines 36-43. In fact, Gottschalk emphasizes that the "main components are styrene and acrylonitrile." Col. 4, lines 6-7.

Therefore, Gottschalk fails on two fronts with regard to the presently claimed oligomer– (1) the weight and number average molecular weight ranges and (2) the monomeric makeup of the oligomers. Likewise, McCormick, Klier, and Emmons fail to remedy the situation. Emmons' failings are described above with regard to the rejection under 35 USC § 102.

McCormick, Klier, and Emmons Also Fail

McCormick is directed to "[p]olymers and copolymers synthesized by means that yield a narrow range of molecular weights can have different properties than polymers synthesized by conventional means. In order to obtain such polymers, however, polymerization must be controlled." Abstract. To do this, McCormick focuses on the use of a "reversible addition-fragmentation chain transfer (RAFT) procedure with dithioesters or trithioesters as chain transfer agents (CTA's)." Paragraph 23. McCormick notes that such "dithioester and trithioester chain transfer agents of the present invention are particularly advantageous [because] [t]hey can be used to produce polymers with low polydispersities." *Id.* McCormick does not disclose materials that meet each and every element of the oligomers described in Claim 1. Hence, as with Gottschalk, McCormick fails to teach the oligomers of the present claims.

Klier is directed to low polydisperse water-soluble polymeric compositions. See Title. The materials of Klier are specifically for use in "detergent formulations..., dispersants,

sequestration agents, antiscalants..., and as dispersants..." Col. 1, lines 7-13. As will be noted, claims 61, 66, and 69 are all directed to polymers that are for use in asphalt, plastics, and rubbers, as, for example, reinforcing agents. Such polymers have different properties and will not be co-extensive with the water-soluble Klier materials which are useful in solution. Thus, the Examiner's reliance upon Klier for a teaching of polydispersity is misplaced with regard to a materials that are used in solution versus those that are found in asphalt, plastics, and rubbers, as is presently claimed.

The fact remains, to establish a *prima facie* case of obviousness, the Examiner must provide reasons to combine or modify the references to teach each and every limitation of the claimed invention. Without more, Applicants submit that Gottschalk in view of McCormick, Klier, or Emmons, alone or in combination, fail to provide the requisite modifications to establish such a *prima facie* case of obviousness, and request that the Examiner reconsider and remove the noted rejections.

Brandstetter and McCormick, Lai, or Greenblatt

Claims 1, 5-63, and 66-76 stand rejected under 35 U.S.C. § 103(a) as being obvious over German Patent No. DE 3150171, issued to Brandstetter *et al.*, in view of U.S. Patent Publication No. 2003/0191262, applied for by McCormick *et al.*, U.S. Patent Publication No. 2003/0187138, applied for by Lai, or U.S. Patent Publication No. 2003/0069363, applied for by Greenblatt. Applicants respectfully traverse this rejection.

As above, the cited references fail to teach or suggest each and every element of the claims as pending. The invention as defined by Claim 1, for example, distinguishes the cited art by reciting "...(a) a free-radically polymerized oligomer obtained from reaction of *one or more monomers selected from the group consisting of vinyl aromatic monomers and ester functional monomers* and *one or more monomers selected from the group consisting of epoxy functional monomers, anhydride functional monomers, ester functional monomers and carboxylic acid functional monomers...*" Emphasis added. Applicants submit that alone or in combination, Brandstetter, McCormick, Lai, and Greenblatt fail to establish a *prima facie* case of obviousness

with regard to the pending claims. With regard to McCormick, Applicants direct the Examiner's attention to the above remarks regarding McCormick as failing to fill the voids of Gottschalk, and those remarks are likewise relevant here with regard to Brandstetter.

A translation of Brandstetter, a German document, was provided by the PTO. Brandstetter is directed to the preparation of block co-polymers based upon ethylene co-polymers that contain any of a number of functional groups. Page 3 of the translation. The ethylene co-polymers are then reacted with living polymer anions. Page 5 of the translation. Brandstetter teaches that the "ethylene copolymers have the general formula: $[(A_n)_i(B_l)_k]$, whereby A = $-CH_2-CH_2-$, B is the co-monomer polymerized in with one of the above-described functional groups..." Page 6 of the translation. Such ethylene co-polymers may be produced by radical decomposed polymerization, which Applicants believe to be a poor translation for a free-radical polymerization. *Id.*

In so describing the identity of the ethylene copolymers, Brandstetter fails to teach or suggest a free-radically polymerized oliogomer obtained by reaction of the recited monomers. The claimed oligomers require the free-radically polymerized oligomer be obtained from the reaction of *one or more monomers selected from the group consisting of vinyl aromatic monomers and ester functional monomers* and *one or more monomers selected from the group consisting of epoxy functional monomers, anhydride functional monomers, ester functional monomers and carboxylic acid functional monomers*..." The Brandstetter materials require ethylene copolymerization with other monomers. Co-polymerization of ethylene with other monomers is not encompassed by the presently pending claims with regard to the free-radically polymerized oligomer.

Here, as in Gottschalk, the materials of Branstetter are effectively *excluded* by the Markush language. Because Brandstetter fails to teach or suggest the claimed free-radically polymerized oligomers, McCormick, Lai, or Greenblatt must be relied upon to teach at least this element. They do not.

Lai, is directed to "s,s'-bis-(α,α'-disubstituted-α"-acetic acid)-trithiocarbonates and derivatives thereof, as well as a process for making the same." Paragraph 2. "Such compounds can be reacted with monomers to form acrylate repeat units within the compound [and subsequently], functional end groups can be added thereto such as epoxy, vinyl, or hydroxyl groups." *Id.* The Examiner relies upon Lai for a discussion of the polydispersities that may be achieved using the described trithiocarbonate materials. Office Action, pages 4-5. Lai does not teach, suggest, or exemplify the free-radically polymerized oligomers as found in the presently presented claims.

Greenblatt is directed to the preparation of oligomers with a low degree of polymerization, without the need for the use of excessive amounts of initiators. Paragraph 13. Again, the Examiner relies upon Greenblatt solely for support related to polydispersity ranges. Office Action, pages 4-5. However, Greenblatt does not disclose polymers having the stated elements, at least with regard to the claimed free-radically polymerized oligomer. Without more, Greenblatt does not fill the deficiencies of Brandstetter.

Applicants submit that Brandstetter in view of McCormick, Lai, or Greenblatt fails to provide the requisite modifications to establish a *prima facie* case of obviousness, and request that the Examiner reconsider and remove the noted rejections.

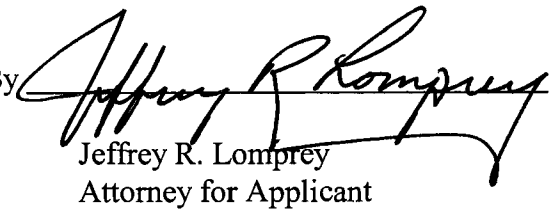
III. Rejoinder

In the Office Action of 1/20/2006, claim 37 was indicated as withdrawn as a non-elected species. 37 C.F.R. § 1.141 provides for rejoinder of non-elected species in an application where a generic claim is found allowable. Applicants submit that claim 1, which is generic to claim 37, is now allowable. As such, Applicants respectfully request that the Examiner rejoin claim 37 pursuant to Rule 141.

Applicants believe the present application to now be in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date June 5, 2008

By 

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